



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,767	04/13/2004	Hisataka Fujimaki	K2020.0010/P010	2984
24998	7590	09/11/2006	EXAMINER	
DICKSTEIN SHAPIRO LLP			BERMAN, JACK I	
1825 EYE STREET NW			ART UNIT	
Washington, DC 20006-5403			PAPER NUMBER	
			2881	

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/822,767	Applicant(s) FUJIMAKI ET AL.	
	Examiner Jack I. Berman	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2006 and 23 August 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2881

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10, 12, 17, 23, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu et al. in view of Yasushi et al. (JP 2001-212253, cited by applicant in the Information Disclosure Statements filed on February 3, 2005 and April 8,2005). As applicant admits on page 2 of the specification, the Chu et al. review article teaches that particle beam irradiation equipment comprising charged particle beam generation equipment and a charged particle beam irradiation nozzle for irradiating a charged particle beam extracted from the charged particle beam generation equipment to an irradiation target, wherein said charged particle beam irradiation nozzle comprises a first scatterer device including a first scatterer through which said charged particle beam passes and a second scatterer device through which the charged particle beam passes after having passed said first scatterer, is known in the art.

Art Unit: 2881

Furthermore, in the paragraph beginning in the right-hand column on page 2082, Chu et al.

teaches:

Scattering characteristics of a given scatterer depend on the incident particle species (charge Z and atomic mass M) and the beam energy. Therefore a double-scattering system developed for a certain beam must be modified if any of these beam parameters are changed. Providing a different occluder system for each particle species and energy used is costly, and changing the systems each time the beam is changed is not practical in clinical operations. *One way to resolve this problem is to vary the locations of the occluder assembly and the second scatterer. When the energy of the beam is modulated by an absorber, and consequently the values of the beam widths are made larger, the occluder assembly may be moved upstream nearer to the first scatterer* [Emphasis supplied] so that the projected radii at the isocenter are proportionally increased. This process compensates the parameters in such a way that the resulting dose distribution again exhibits an acceptable deviation from the average.

This clearly teaches a person having ordinary skill in the art to position a second scatterer in the passage region at a first position in the direction of travel of a charged particle beam when the second scatterer is being configured to provide a smaller scattering strength of the charged particle beam in a direction perpendicular to the direction of travel of the charged particle beam than when the second scatterer is positioned in the passage region at a second position upstream of the first direction in the direction of travel of the charged particle beam. Chu et al. also teaches to provide a collimator to shape the charged particle beam. While Chu et al. does not teach how the position of the second scatterer could be varied, Yasushi et al. teaches, at paragraphs [0136]-[0139] of the translation provided by the applicant, that the position of a scatterer can be varied by providing a plurality of scatterers, each of which may comprise a table on which a plurality of different scattering films of different thicknesses from one another are mounted, at different locations and to choose which scatterer to used based upon the degree of scattering desired with the position of the chosen scatterer being further upstream of the direction of travel of the charged particle beam when more scattering is required. It would have been obvious to a person

Art Unit: 2881

having ordinary skill in the art to use Yasushi et al.'s system of plural alternatively selected scatterers of different thicknesses at different positions along the direction of travel of the charged particle beam to effect the desired function of changing the position of the second scatterer taught by Chu et al. As Yasushi et al. indicates at paragraph [0136], the equipment would have to have a control system (control computer 8) to control the equipment, including the selection of the appropriate second scatterer and it would have been obvious to a person having ordinary skill in the art to base this selection on the treatment plan information, including irradiation field information and energy information of an ion beam, because both Chu et al. and Yasushi et al. teach that the selection of the second scatterer and the energy of the ion beam affect the irradiation of the diseased part of the patient and this irradiation must be carefully matched to the desired treatment plan in order to effectively irradiate only the diseased part of the patient without damaging nearby healthy organs in the patient. It would have been obvious to a person having ordinary skill in the art to use the equipment for its intended function by selecting the selected second scatterer at the selected position and having the selected thickness, which may be different from that of a first second scatterer, and emitting the charged particle beam to pass through the first scatterer and the selected second scatterer.

Claims 10, 11, 15, 16, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu et al. and Yasushi et al as applied to claims 1-10, 12, 17, 23, and 26-29 above, and further in view of either Moyers et al. or Hernandez et al. While Yasushi et al. teaches, as is discussed above, that each of the scatterers may comprise a table on which a plurality of different scattering films are mounted, Yasushi et al. does not teach explicitly how to position the selected scattering film in the path of the charged particle beam. Moyers et al. teaches that moving a selected second scattering film into position can be accomplished by

Art Unit: 2881

rotating the table on which the plurality of films are mounted so that the table moves in a direction perpendicular to the direction of travel of the charged particles until the selected film is in the appropriate position in the same way as that illustrated in Figure 3 of the instant application. Hernandez et al. teaches that moving a selected scattering film into position can be accomplished by linearly translating the table on which the plurality of films are mounted so that the table moves in a direction perpendicular to the direction of travel of the charged particles until the selected film is in the appropriate position in the same way as that illustrated in Figure 4 of the instant application. It would have been obvious to a person having ordinary skill in the art to use either the Moyers et al. translation apparatus or the Hernandez et al. translation apparatus to provide the required means to move the selected one of the plurality of different scattering films on any one of Yasushi et al.'s scatterers into the appropriate position when that scatterer is moved into the operative position to fulfill the second scatterer function at varied locations taught by Chu et al.

Claims 13, 14, 18-20, 24, 25, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu et al. and Yasushi et al as applied to claims 1-10, 12, 17, 23, and 26-29 above, and further in view of Huntziger. In the embodiment of the invention illustrated in Figure 11, Huntziger teaches that the position of a scatterer along the direction of travel of a beam of charged particles can be changed by moving the scatterer along this direction of travel. The use of Huntziger's means for moving either the first scatterer or one or more of the second scatterers along the direction of travel of a beam of charged particles instead of or in addition to Yasushi et al.'s means for providing alternatively selectable scatterers at different positions along this direction of travel would have been an obvious substitution of equivalents or an obvious duplication of parts to provide finer control of the resulting beam profile.

Applicant's arguments filed July 20, 2006 have been fully considered but they are not persuasive. Applicant argues that Chu et al. does not teach to provide a plurality of second scatterers and Yasushi et al. does not address a double scattering method. As was explained in the final rejection mailed on March 24, 2006, since the rejection is based on the combination of the teachings from the references and not on the references individually, it is irrelevant that neither reference anticipates the claimed invention. As for applicant's recitation of the point of law that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or combine references to arrive at the claimed subject matter", the examiner has explained above and in previous Office actions that it would have been obvious to a person having ordinary skill in the art to use Yasushi et al.'s method of providing scatterers at different positions along the direction of travel of a charged particle beam as a practical means of performing the function of varying the position of the second scatterer, a function taught by Chu et al. without a means disclosed by Chu et al. to perform it. As for applicant's argument that Yasushi et al. teaches only to make the individual films in each scatterer device with thicknesses differing from each other, not to make the thicknesses of different second scatterers at different positions different from each other, since each scatterer has a selectable thickness that is independent of the thickness of other scatterers, it would have been obvious to a person having ordinary skill in the art to provide the scatterers at different positions with thicknesses different from each other.

Applicant also argues:

...Chu merely teaches that the occluder assembly (and second scatterer 7) is moved when the beam energy is varied by the absorber, but does not mean "when the second scatterer is being configured to provide a smaller scattering strength" as alleged in the Office Action.

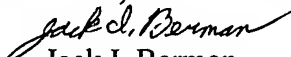
Art Unit: 2881

The examiner does not understand what applicant is trying to say in this argument and therefore cannot respond to it.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack I. Berman whose telephone number is (571) 272-2468. The examiner can normally be reached on Monday-Thursday (8:30-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Jack I. Berman
Primary Examiner
Art Unit 2881

jb
9/5/06